



Sustainable Consumer Products from Recycled Textiles: Benefits, Economic Efficiency, and Environmental Influence

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Abstract

This research paper explores the utilization of recycled textiles in manufacturing consumer-utility products, examining the environmental, economic, and social impacts of textile recycling. Through literature review and industry analysis, the research explores methodologies for textile recycling, performance results of recycled materials, and real-world applications in consumer products, ranging from apparel to home furnishings. The study highlights significant reductions in water and energy consumption, greenhouse gas emissions, and landfill waste when recycled fibres are used in place of virgin materials. Companies such as Adidas, IKEA, and Patagonia exemplify the successful integration of recycled fibres into apparel, home goods, and accessories, demonstrating both cost efficiency and market growth driven by sustainability-conscious consumers. Technological advances in mechanical and chemical recycling have improved fibre quality, opening new possibilities for broader application. While challenges such as contamination and sorting remain, ongoing innovation and collaborations are driving progress. The paper discusses how policy, design innovation, and consumer awareness can help overcome these barriers. We conclude that recycled textiles offer a viable path to more sustainable consumer products, provided systemic changes in the supply chain, regulation, and investment accompany them. Ultimately, the adoption of recycled textiles supports the circular economy, fosters brand reputation, and proves economically viable for manufacturers, making it a critical strategy for advancing sustainability in the global textile and consumer goods industries.

Keywords: Circular economy; Consumer goods; Cost efficiency; Performance properties; Recycled Textiles.

1. Introduction

The global textile and apparel industry contributes significantly to environmental degradation. Massive water usage, chemical pollution, energy consumption, and greenhouse gas emissions are associated with fibre cultivation/production, processing, dyeing, finishing, and end-of-life disposal of garments (Abrishami et al., 2024; Moazzem et al., 2021). The current scenario of production, use, and disposal dominates in many regions, resulting in enormous textile waste, much of which ends up in landfills or is incinerated, exacerbating environmental issues (Ramírez E et al., 2024). Recycling textiles, both mechanically and chemically, offers potential for reducing this environmental burden, conserving resources, and

improving economic efficiency by avoiding virgin material costs and improving material output (A review of the socio-economic advantages of textile recycling, 2019; Sandin G, et al., 2025). Recycled textiles, derived from post-consumer and post-industrial waste, offer a promising avenue for reducing resource depletion and environmental degradation (Sandvik, I. M. & Stubbs, W., 2018). Recent advancements in textile recycling technologies have enabled the conversion of discarded fibres into high-quality consumer goods. Recycled textiles can be found in products such as clothing, bags, upholstery, and home accessories, contributing to reduced waste, energy consumption, and carbon emissions. The circular economy model

emphasizes reusing materials to minimize waste (Stahel, W.R., 2016). Using recycled textiles can transform discarded fabrics into new products, thereby reducing the need for virgin resources. However, the adoption of recycled textiles faces challenges, such as collection, sorting, and processing infrastructure, costs may be higher, consumer perception sometimes disfavours recycled textiles due to concerns about durability or aesthetics, technological constraints, and high initial costs (Leal, F.W., & Ellams, D., Judd, B., 2019). The excessive production and disposal of textiles contribute substantially to environmental degradation through landfill accumulation, water pollution, and resource depletion (Sandin G, et al., 2018). The advent of recycled textiles, especially recycled polyester fibres derived from post-consumer PET bottles, has revolutionized the industry by transforming waste into value (JB Ecotex, 2024). Moving towards sustainable consumer products through recycled textiles aligns with global efforts to address climate change, resource scarcity, and the escalating demand for environmentally conscious goods (EuRIC, 2023).

2. Methodology

This study utilizes a literature review approach, gathering data from lifecycle assessments, industry reports, and peer-reviewed articles. Environmental, economic, and quality impacts of recycled textiles in consumer products are compared with those of conventional materials. Data sources include company case studies, international sustainability foundations, and regulatory bodies focused on circular economy transitions (JB Ecotex, 2024; Sandin et al., 2018; EuRIC, 2023).

3. Results and Discussion

3.1. Environmental Benefits

- Recycled polyester staple fibre (RPSF) production uses 50% less energy than virgin polyester, resulting in lower greenhouse gas emissions and resource conservation (JB Ecotex, 2024).
- Each high/medium-quality reused or recycled clothing item saves up to 3 kg of CO₂ and uses 0.01% of the water needed for new garment production (EuRIC, 2023).
- Recycling textiles diverts plastic and fabric

waste from landfills and oceans, saving up to 32 million barrels of oil annually (JB Ecotex, 2024).

3.2. Economic Efficiency

- The use of recycled textiles lowers raw material and production costs, benefiting manufacturers and brands (JB Ecotex, 2024).
- Economic resilience is improved through circular supply chains, reducing vulnerability to market fluctuations and resource scarcity (WeForum, 2025).
- New industry opportunities arise in recycling, sorting, and manufacturing, with accompanying job creation (WeForum, 2025).
- As shown in Table 1, the energy consumption, water usage, and chemical usage for recycled textiles are much lower than those for virgin textiles, whereas the total production costs are relatively higher due to sourcing, sorting, and technology facilities involved in the recycling process (Oxford Maker,2025; Knowing fabric,2025; Fashionating World,2023; LQ Textile,2024).

Table 1 Comparative Cost Efficiency of Recycled vs Virgin Textiles

| Parameters | Recycled textiles | Virgin textiles |
|------------------------|-------------------|-----------------|
| Energy consumption (%) | 30-50 | 100 |
| Water usage (%) | 10-30 | 100 |
| Chemical usage (%) | 30-60 | 100 |
| Production cost (%) | 110-260 | 100 |

3.3. Market and Quality Implications

- Recycled textiles such as RPSF retain durability, tensile strength, and resistance to wear, maintaining product quality (JB Ecotex, 2024).
- Consumer demand for sustainable products is rising, enhancing brand value and market differentiation for companies adopting



recycled materials (WeForum, 2025).

3.4. Policy and Lifecycle Considerations

- Policy interventions like Extended Producer Responsibility (EPR) and eco-design mandates can accelerate recycling rates and expand market competitiveness (Sandin G, et al., 2018).

Conclusion

Integrating recycled textiles into consumer products reduces environmental impact, supports cost efficiency, and aligns product quality with sustainability goals. The transition to circular textile economies is bolstered by technology, regulation, and consumer awareness. Sustainable textile solutions thus offer promising pathways for meeting the challenges of a resource-constrained future. Recycled textiles hold considerable promise for advancing sustainable consumer products, offering both environmental and economic benefits. When compared to virgin materials, recycled fibres can significantly reduce greenhouse gas emissions, water use, and dependency on non-renewable resources; economically, they can yield cost savings over time and foster new job streams.

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